Anaconda Reduction Department
Anaconda Vicinity
Deer Lodge County
Montana

HAER No. MT-37

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WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, D.C. 20240

HISTORIC AMERICAN ENGINEERING RECORD

ANACONDA REDUCTION DEPARTMENT
MT-37

Date: Foundry Department, 1885-89
Smelter. 1902 with later additions
"Big Stack," 1918

Location: 1 mile southeast of Anaconda City limits

Engineer/Builder: Frank Kleptko, Superintendent
H. Repath, Chief Engineer

Owner: Atlantic Richfield Company

Significance: The Foundry Deaprtment of the Anaconda Reduction Department was organized as an independent venture in the late 1880s. Originally known as the Anaconda Hardware Company--dealers in stoves, iron, steel, cutlery, and glassware--the firm was purchaced by the Tuttle Maunfacturing and Supply Company in 1890. This latter concern expanded the complex to include the production of industrial wire, engines and boilers as well as domestic hardware. The firm also served as agents for mining supplies and machinery, including Ingersoll Sargent rock drills and Knowles steam pumps, until purchased by the the Anaconda Copper Mining Company in 1896. Under the ACM Co., the Foundry Department competed with eastern manufacturers specializing in mining, milling, smelting and dredging machinery. A pattern shop, a brass and bronze molding shop, an iron molding shop, a machine shop, a boiler shop, a forge shop, and an electrical repair shop formed the complete facilities operating here in the early 20th century. Serving as a production unit, the foundry manufactured architectural ironwork, including cast-iron doorsteps, storefront columns and lamp posts. Many of these items are evident in the city's historical structures today.

At the present time, the foundry serves solely as a repair facility for the Anaconda Reduction Works, for the Butte, Anaconda and Pacific Railroad, and for the Weed Smelter in Butte. The current site includes most of the late 19th- and early 20th-century brick structures. Of particular note is a multi-story wood-frame warehouse which contains a complete inventory of the original wooden patterns made on the site and used un the casting shops since the late 1890s.

The Anaconda Reduction Departmenrt is loacted on a 300 acre site at the southeast hillside of Warm Springs Valley,

approximately one mile east of the residential limits of Anaconda. Originally built as the Washoe Smelter under the direction of Frank Kleptko, Superindendent, and H. Repath, Chief Engineer, this plant began operations in the city of Butte, 26 miles to the southeast of this site. Completed, the smelting works had a capacity of treating 5000 tons of ore per day and represented the largest non-ferrous metallurgical plant in the world.

Over 2000 men were employed in all departments including a concentrating mill, sampling department, powerhouse, roasting plant, briquetting plant, blast and reverberatory furnace departments, arsenic plant, converter plant, and slime and tailings pond. A succession of renovations and improvements of equipment and facilities began as early as 1904-05 for the purpose of augmenting both the quantity and economy of operations. These improvements consisted primarily of increases in the capacity of the smelter's reverberatory furnaces and converters. In 1914-1915 a sulpheric acid plant was added at the foot of the works. Now partially dismantled, the acid plant had a capacity of 100 tons per day and was built in conjunction with a 2000-ton unit leaching plant. In 1920 a phosphate plant, using phosphate rock from the Anaconda Copper Mining Company's mines at Conda, Idaho, was erected at the works for the purposes of manufacturing high-grade fertilizer.

By 1936,the reduction works treated approximately 13,000 tons of copper ore every 24 hours and yielded 13% of the copper produced in the United States. A seven acre concentrating plant, located on the property and employing the flotation process, treated zinc ores and phosphate rock in addition to copper ores. The works also operated a zinc plant at this time with a capacity rated at 170 tons of cathode zinc per day. Subsequent modifications also included the installation of a lime rock kiln in the 1960s and again in the 1970s.

With the construction of the Weed Concentrator at the Berkeley Pit in Butte, the concentrator at this site ceased operations between 1962-64. The complex of former concentrator buildings, in addition to the zinc plant and Cotrell dust treaters, were scheduled for removal in the early 1980s. Although a 36 magawatt electric smelting furnace was installed at the works in 1975-76, eight reverberatory furnaces, measuring 110' X 140' remain in situ. The company's general offices at the the works retain much of their original appearance, while numerous

multi-story brick buildings at the plant have been modified architecturally in order to accomodate modified processes and new equipment.

Erected in 1918, the "Big Stack' of the Anaconda Copper Mining Company is constructed of perforated brick laid in acid-resisting mortar with built-in bands of reinforcing steel. The stack measures 585' high and rests on a concrete foundation. It has an inside diameter of 75' at the base and 60' at the top with the wall varying from 6' to 2' thick from bottom to top.

The stack has a discharge capacity of three to four millions cubic feet of gas per minute. It originally received hot furnace gases from the smelter through a brick flue approximately 1/2 mile in length, The flue, still partially in use, measures 60' wide at its base and widens to 120' at the top of the hill where it discharges gas into the stack. With walls 20' high, the main flue provided a large space whereby particulate matter and dust from the smoke from the reverberatory furnaces precipitated to the bottom of the flue during its passage from the smelter to the stack.

At the base of the stack are located a series of electrical dust precipitators, or Cotrell Treaters, through which all gases passed before entering the stack. This 20-unit installation was designed to remove arsenic, zinc and lead vapors, in addition to dust, generated by the various smelting operations. Each of the box-type treater units consisted of a rectangular chamber measuring approximately 27' long, 22' wide, and 40' high. These were connected to the main inlet flue near the bottom by means of a smaller cross flue.

Today the stack is the sole chimney employed by the Anaconda Smelter. The brick flue has been largely superceded by a high velocity circular flue installed ca. 1970. The dust treaters at the bottom of the stack were dismantled in 1979.

Researchers are referred to Quivik, Fredric, "Smelters: Anaconda and Great Falls" Speculator: A Journal of Butte and Southwest Montana History Summer 1984, and to the collections of the Montana Historical Society for source material and historic photographs.

Transmitted by: Monica E. Hawley, Historian, 1984

ADDENDUM TO
ANACONDA REDUCTION DEPARTMENT
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